

# **Quality Management Office**

## **Occurrence Reporting & Processing System (ORPS) Quarterly Performance Analysis and Summary**

### **2nd Quarter CY 2004**

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## **I. Executive Summary**

This is the third edition of the Occurrence Reporting and Processing System (ORPS) Quarterly Performance Analysis and Summary. The report is developed and issued by the Brookhaven National Laboratory (BNL) Quality Management Office, as required by Department of Energy (DOE) Order 231.1A, *Environment, Safety and Health Reporting*.

In this analysis period, BNL reviewed a total of 68 documents/issues from the following documented sources: Occurrence Reports; ORPS nonreportable events logged by ORPS Categorizers, Radiological Awareness Reports (RARs), Nonconformances assigned a risk level of A1 or A2, Procurement Nonconformances, and conditions entered into the Institutional Assessment Tracking System (ATS).

Performance analysis of the data included in this report identified an increase in the number of events/conditions involving equipment/material problems. Further analysis indicated that a significance category “R” recurring occurrence report was not warranted.

### **New Area of Concern**

Analysis of the data has identified electrical utility strike incidents as being a new area of concern. Six electrical utility strikes have occurred since CY 2000, and four out of the six have occurred since CY 2002.

BNL management’s aggressive stance in addressing the causal factors associated with these incidents is necessary to ensure corrective and preventive actions (specified in these associated occurrence reports) are effectively implemented in order to prevent recurrence.

In addition, it is recommended that BNL management take advantage of the resources directed toward the OHSAS 18001 program. In that regard, Job Risk Assessments should be developed for demolition and decommissioning of jobs. The OHSAS Management Reviews for the pilot organizations should address performance in electrical safety and evaluate the effectiveness of current controls used to eliminate hazards. Management for the pilot organizations should establish specific objectives and targets aimed at reducing the risk associated with work involving demolition or decommissioning in CY 2005.

### **Area Requiring Continued Management Attention**

Occurrence report CH-BH-BNL-BNL-2004-0005 “Recurring Material Handling Problems,” was declared on March 24, 2004. Subsequent to the issuance of this occurrence report, the following nonreportable material handling events also occurred, as follows:

- Damaged detector at STAR after 10 foot drop on May 17, 2004.

- 500 # steel block falls (3 to 4 feet) from forklift on June 11, 2004.

In a further response to these continuing material handling events, the BNL ORPS Coordinator initiated and facilitated a meeting with cross functional management to discuss the adequacy of the previously imposed interim measures and the possible need for further enhancement. The status of the “Recurring Material Handling Problems” ORPS Report was also discussed and an Update Report was submitted on June 18, 2004, primarily due to the need for development and reporting of further interim measures.

Continued management attention is highly recommended to prevent recurrence of recurring material handling problems. It is recommended that BNL management take advantage of the resources directed toward the OHSAS 18001 program. In that regard, Job Risk Assessments should be developed for material handling jobs. The OHSAS Management Reviews for the pilot organizations should address performance in material handling safety and evaluate the effectiveness of existing controls used to reduce the hazards. Pilot organization managements should establish specific objectives and targets aimed at reducing the risk associated with material handling work in CY 2005.

BNL management needs to aggressively address the issue of material handling (by mechanical means) to prevent recurrence and to prevent similar events.

## **Background**

The revised DOE ORPS Program was implemented at BNL on November 10, 2003. The revised system is intended to reduce nuisance reporting, clarify confusing reporting criteria, and place a new emphasis on performance analysis.

The purpose of the performance analysis is to ensure that recurring events are identified. Guidance concerning the identification of recurring events is provided in DOE Guide 231.1-1, *Occurrence Reporting and Performance Analysis Guide*. The following examples of questions are considered indicators of a recurring event: Did related events having the same underlying cause occur within a single facility or operation? Did the trending data for a series of events indicate a significant negative trend? Did related series of events breach multiple barriers protecting workers, the public, or the environment from potential or actual adverse impacts? Events identified as recurring will be processed as a significance category “R” recurring occurrence report.

A performance analysis will be conducted quarterly and include a review of ORPS and non-ORPS events/issues over a 12-month rolling year. The ORPS Quarterly Performance Analysis will identify recurring/programmatic issues, if any exist. In addition to a performance analysis, this report will include an ORPS Quarterly Summary.

## II. Introduction:

The ORPS Program is intended to ensure the timely collection, reporting, analysis, and dissemination of information on environmental, safety, and health issues, and to ensure the Department of Energy (DOE) and National Nuclear Security Administration (NNSA) are informed of events that could adversely affect the health and safety of the public or workers, the environment, the intended purpose of DOE facilities, or the credibility of DOE. The ORPS Quarterly Performance Analysis and Summary analyzes issues to identify possible recurring program deficiencies and describes ORPS program activities. If a recurring program deficiency is identified, it will be reported to DOE via a significance category “R” recurring occurrence report.

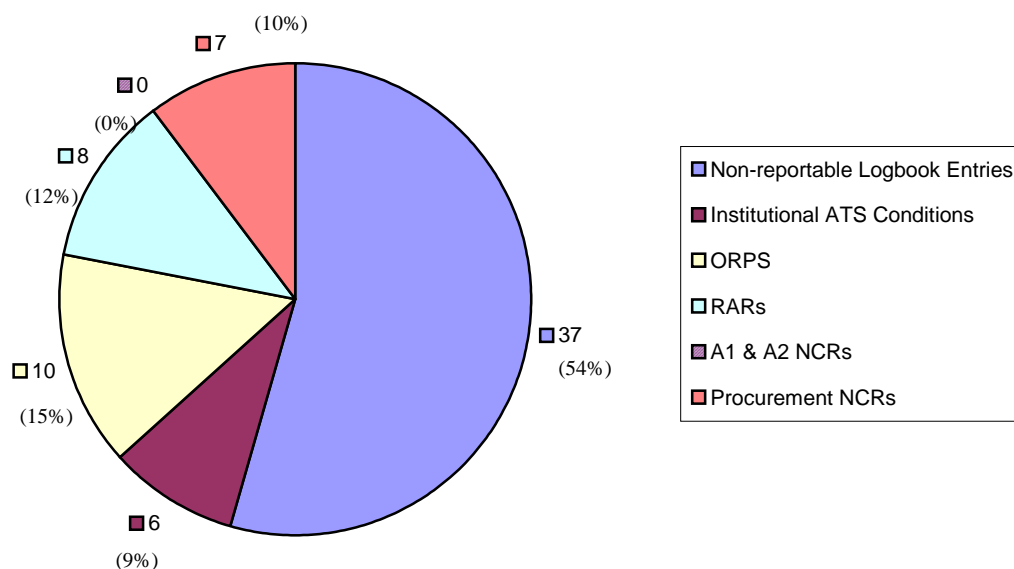
Section III of this report includes a summary of the documents reviewed and a performance analysis of the issues/events reviewed. Section IV summarizes the ORPS Program activities for the second quarter of CY 2004, including the status of ORPS reports and associated corrective actions. Section V highlights Issues for Brookhaven Site Office/Brookhaven National Laboratory Management Awareness.

## III. Performance Analysis

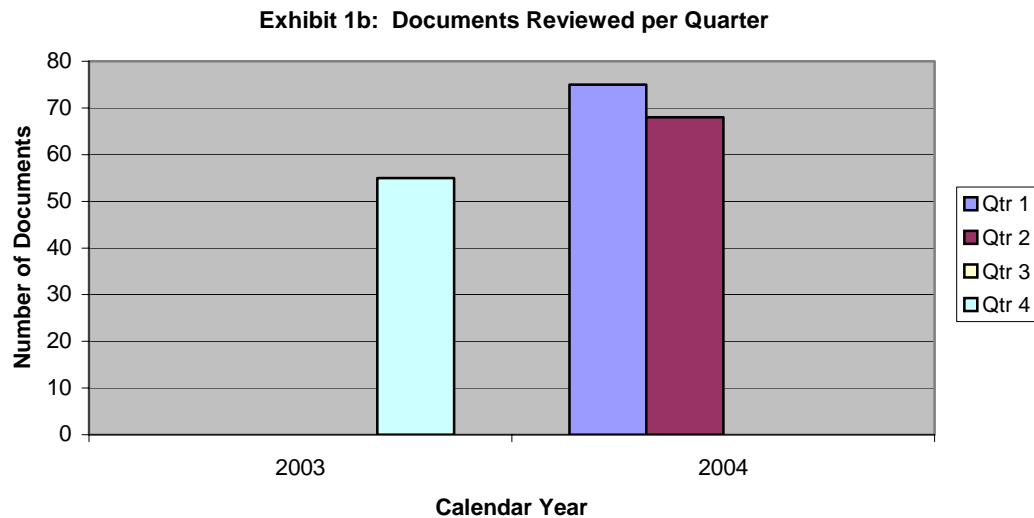
The following exhibits provide a summary of the issues reviewed for the second quarter of CY 2004, including a summary of the documents reviewed and trend analysis.

### A. Document Review Summary:

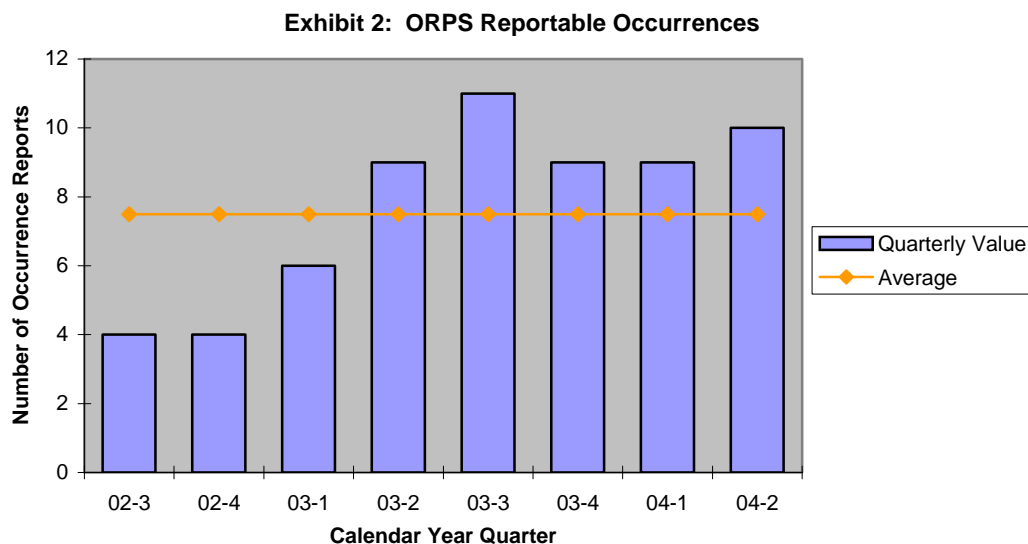
Exhibit 1a: Documents Reviewed for Second Quarter CY 2004 Analysis



**Exhibit 1a** indicates 68 documents were reviewed for the second quarter performance analysis of CY 2004. Approximately 54% of the documents reviewed were ORPS nonreportable logbook entries made by the on-call ORPS Categorizer. Two of the nonreportable logbook entries were also captured as Radiological Awareness Reports (RARs). There were no A1 & A2 Nonconformance Reports received by the Quality Management Office this quarter.



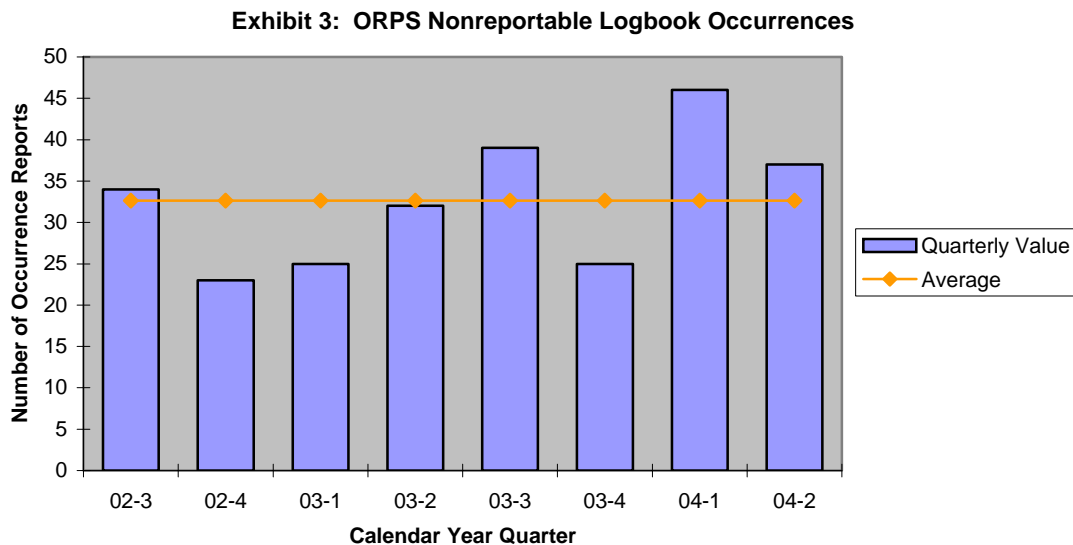
**Exhibit 1b** shows the number of documents reviewed per quarter from the fourth quarter of CY 2003 through the second quarter of CY 2004. On average, 66 documents per quarter have been reviewed.



**Exhibit 2** shows the number of ORPS Reportable Occurrences per quarter from the third quarter of CY 2002 through the second quarter of CY 2004. The graph indicates the number of reportable occurrences increased from the fourth quarter of CY 2002 through the third quarter of CY 2003. Recognizing the potential significance of this

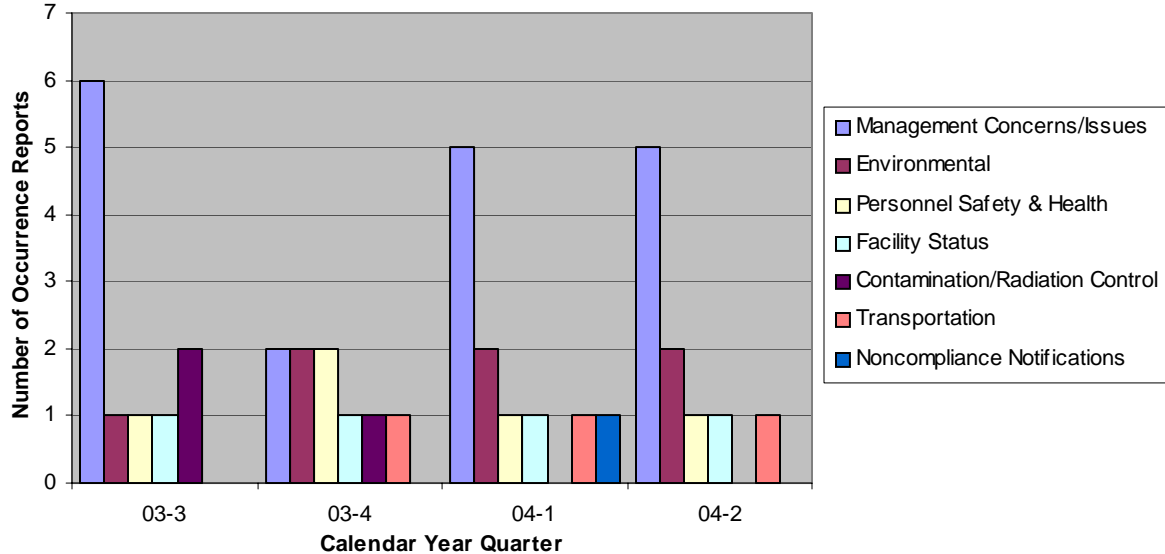
upward trend, BNL commissioned (October 2003) an independent Multidisciplinary Task Force charged with reviewing the causal factors for these incidents and determining if there are similarities and opportunities for improvement.

The BNL Price-Anderson Amendment Act (PAAA) Working Group reviewed the final Multidisciplinary Task Force report and concluded there were no PAAA noncompliance issues identified in the report. However, the Assistant Laboratory Director (ALD) for ESH&Q requested that all ALDs review the conclusions in the report and take action as appropriate to include modification of self-assessment plans.



**Exhibit 3** depicts the number of BNL events/conditions evaluated by BNL ORPS Categorizers and subsequently determined to be nonreportable (as per ORPS criteria) since the third quarter of CY 2002. The number of nonreportable occurrences logged by categorizers averages 33 per quarter.

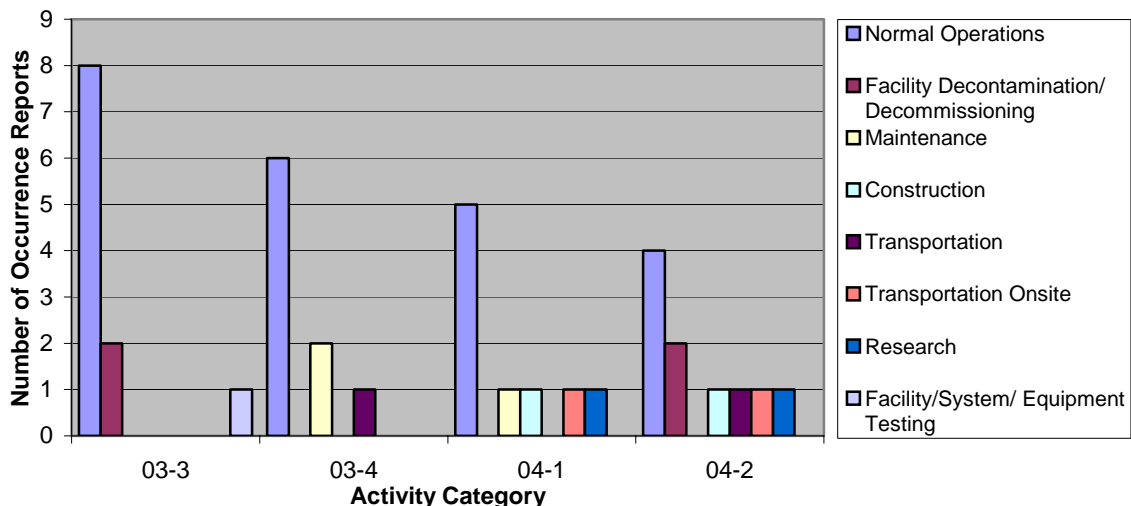
**Note:** The eight BNL ORPS Categorizers are a cadre of volunteer senior personnel who have received significant training on the reporting criteria of *DOE Manual 231.1-2, Event Reporting and Processing of Operations Information*. They are on a rotating schedule, and are available 24 hours a day, 7 days a week to determine event reportability. Each determination that a categorizer renders is logged with justification. It is important that BNL staff draw upon the categorizer's expertise shortly after event/condition discovery so that a timely, accurate, and consistent determination of ORPS reportability is rendered.

**Exhibit 4: Distribution of ORPS Reports by Reporting Criteria**

**Exhibit 4** is a trend of BNL ORPS reports coded by various categories of Reporting Criteria. Reporting criteria used prior to the ORPS redesign (implemented at BNL on November 10, 2003) were mapped to the new reporting criteria during the generation of the above graph. One year's worth of data is presented and there is no adverse trend noted. It should be noted that BNL does not shy from reporting events/conditions within the Management Concerns/Issues category. This category includes "near miss, where no barrier or only one barrier prevented an event from having a reportable consequence" and "an event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern to other facilities or activities in the DOE complex." Due to the varying scopes of work and the interpretive differences for determining "management concern," reporting under this (for the most part) otherwise "gray" area criterion is not always readily discernible and the ability to categorize events/conditions under this criterion indicate a proactive reporting culture at BNL.

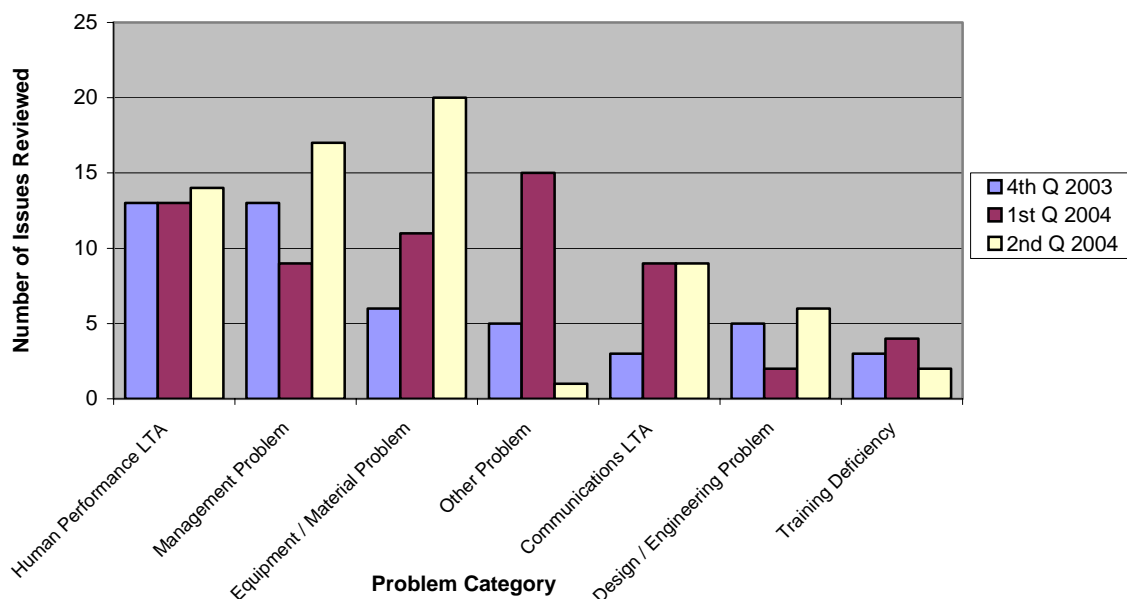


**Exhibit 5: Distribution of Occurrence Reports by ORPS Activity Category**



**Exhibit 5** is a trend of ORPS reports coded by activity category. BNL continues to see most reports coded with the “Normal Operations” category (as would be expected). There is no adverse trend noted.

**Exhibit 6: Analysis of Issues by Cause Code**



**Exhibit 6** is a trend of ORPS cause codes from the fourth quarter of CY 2003 through the second quarter of CY 2004. The associated issues were reviewed and apparent cause codes were assigned (some issues were assigned more than one cause, and some issues were determined to be of no significance and therefore were not assigned a cause code) from the ORPS Causal Analysis Tree in the *DOE G231.1-2, Occurrence Reporting Causal Analysis Guide*.

An increase in the number of incidents involving equipment/material problem has been noted during the time period under investigation and warrants further analysis as follows:

**Equipment/material problem**

As shown in Exhibit 6 above, the equipment/material problem code was cited more often than in the previous two quarters. Analysis reveals that 14 out of 20 or 70% of the initiating conditions/events had apparent causes related to defective or failed materials or parts. The remaining 30% had apparent causes related to end of life failure (3), material storage (3) less than adequate (LTA), post-maintenance/post modification testing LTA (1), and preventive maintenance LTA (2). Further analysis of the individual initiating conditions/events does not indicate a recurring problem.

**Note:** The following are the definitions of the cause codes as defined by the *DOE G231.1-2, Occurrence Reporting Causal Analysis Guide*:

- Human performance less than adequate refers to an event or condition resulting from the failure, malfunction, or deterioration of the human performance associated with the process. This category is intended for individual actions or lack thereof.
- Management problem refers to an event or condition that could be directly traced to managerial actions or methodology (or lack thereof). A “management” problem can be attributed to management methods (directions, monitoring, assessment, accountability, and corrective action), inadequate resource allocation, work organization and planning, supervisory methods, and/or change management practices.
- An equipment/material problem is defined as an event or condition resulting from the failure, malfunction, or deterioration of equipment or parts, including instruments or material.
- A design/engineering problem is an event or condition that can be traced to a defect in design or other factors related to configuration, engineering, layout, tolerances, or calculations.
- Other problems include problems caused by factors beyond the control of the organization (i.e., legacy radiological or hazardous material).
- Communications less than adequate refers to inadequate presentation or exchange of information.
- Training deficiency refers to an event or condition that could be traced to a lack of training or insufficient training to enable a person to perform a desired task adequately.

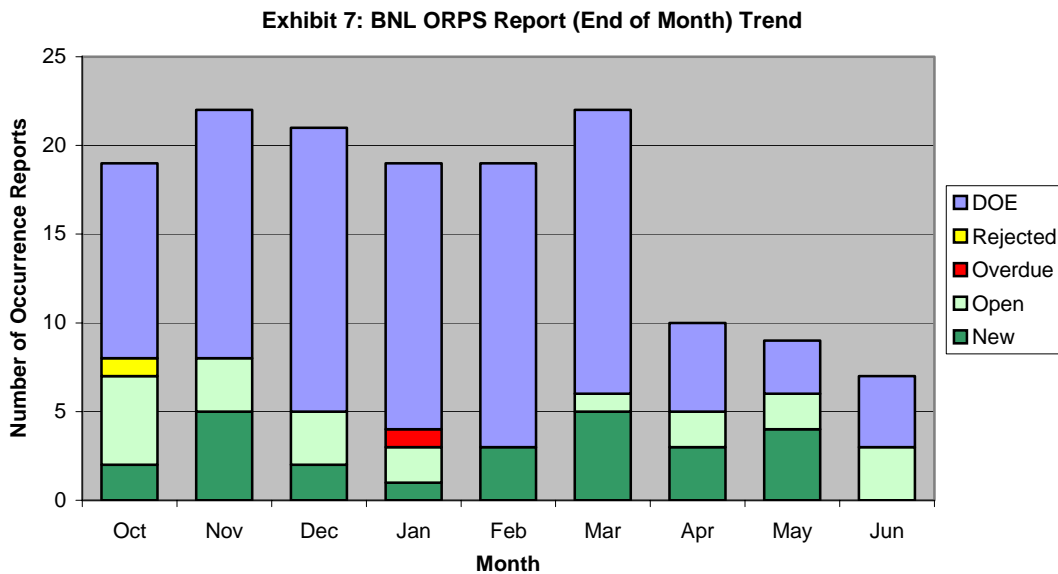
## B. Electrical Safety 1997 to Present

During this quarter DOE requested data concerning electrical safety occurrences that have occurred at BNL since 1997. The ORPS database indicates 27 occurrences related to electrical safety have been reported since 1997. Thirty percent of those occurrences involved an electrical shock to the worker. Thirty-three percent of the 27 occurrences involved electrical utility strikes. Six of these utility strikes have occurred since CY 2000, and four out of the six occurred since CY 2002, as follows:

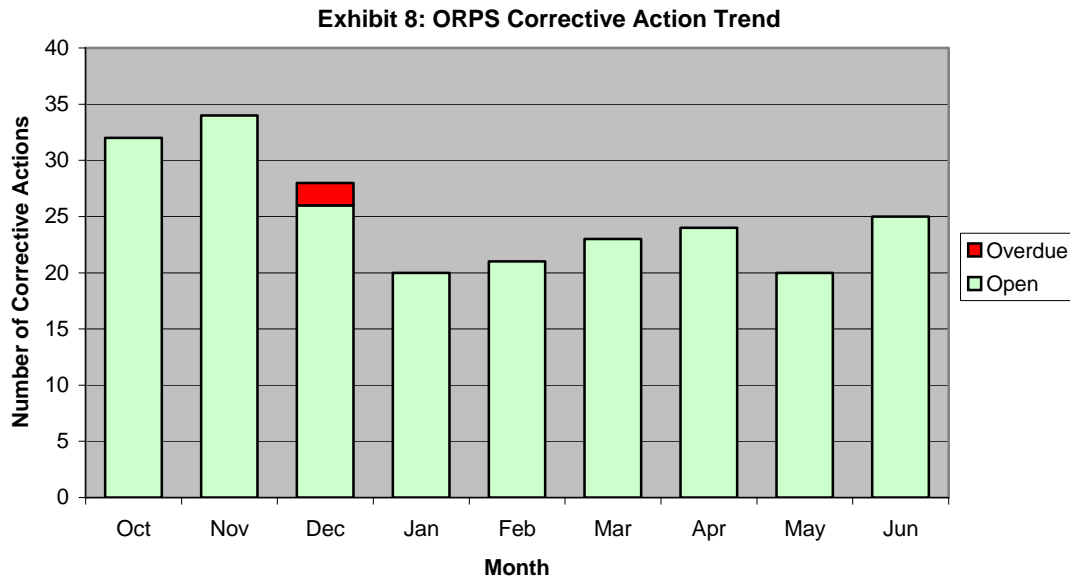
- Subcontractor Personnel Drilled Anchor Bolts in Concrete Encased Electrical Duct Bank on May 6, 2002.
- Minor Utility Strike During Horizontal Boring Operations on June 6, 2002.
- Communication Cable Struck During Excavation on January 8, 2003.
- Electrical Utility (Encased in Concrete Floor) Conduit Strike on April 19, 2004.

## IV. ORPS Activities

The following exhibits illustrate the status of BNL ORPS Reports and ORPS corrective actions:



**Exhibit 7** depicts the ORPS Report trend. Reports are shown in various states to include: awaiting DOE approval, rejected by DOE, overdue for submission to DOE, in progress (open), or new report issued. No adverse trend is noted.



**Exhibit 8** depicts the trend of corrective actions associated with ORPS Reports. There were no overdue actions associated with an occurrence report during the second quarter of CY 2004 reporting timeframe.

**The following is a summary of ORPS activities that have occurred during the second quarter of CY 2004:**

- The BNL ORPS Coordinator and the DOE Brookhaven Site Office (BHSO) ORPS Coordinator meet weekly to discuss the status of the ongoing ORPS implementation plan and the overall BNL ORPS Program.
- The BNL ORPS Office facilitated an Assessment Tracking System (ATS) users group meeting in support of tracking and trending laboratory issues of concern on April 14, 2004. With modification, ATS can be used to supply data for the ORPS performance analysis.
- The BNL ORPS Office presented “ORPS Update/Status” to Facilities and Operations management on April 22, 2004.
- The BNL ORPS Office collaborated with BHSO on a causal analysis for a BHSO finding concerning the Emergency Management System and their related training program on April 23, 2004.
- The BNL ORPS Office presented “Recurring Material Handling Problems” to the Price-Anderson Amendments Act (PAAA) Working Group on April 26, 2004. This condition was reported to DOE in the second quarter of CY 2004 under “NTS-CH-BH-BNL-BNL-2004-002, Recurring Material Handling Problems.”

- The BNL ORPS Office facilitated a quarterly Categorizer's Workshop (#2004-01) on April 29, 2004. The goals of this workshop are to
  - evaluate and improve the BNL Occurrence Reporting Program;
  - maintain a baseline categorization process such that reportability decisions are both valid and consistent;
  - continue to assimilate the new ORPS Model.
- The BNL ORPS Office met with BHSO on April 29 and May 4, 2004 in regard to "Portage" (a contractor directly funded by DOE/EM) registration to access the ORPS database.
- The BNL ORPS Office served on a committee, which issued "Report of the Committee Investigation of the Category "R" Recurring Occurrence (CH-BH-BNL-BNL-2004-005)" on May 20, 2004 (Revision 1).
- The BNL ORPS Office developed the second iteration of the Occurrence Reporting & Processing System (ORPS) Quarterly Performance Analysis and Summary. The report was issued on May 21, 2004.
- On May 14, 2004, the ORPS Coordinator participated in the incident critique involving a worker's filter cartridge becoming separated from the accompanying respirator during the performance of work in an airborne contamination area.
- The BNL ORPS Office Participated on the Environment, Safety, Health and Quality (Tier I) Inspections Subject Area development team – ongoing.
- The BNL ORPS Office Participated in the development of the "Recurring Material Handling Problems" ORPS Report action plan on June 2, 2004.
- The BNL ORPS Office presented "ORPS Update/Status" at the Building Manager's Meeting on June 8, 2004.
- The BNL ORPS Office facilitated a meeting concerning the status of the "Recurring Material Handling Problems" ORPS Report and submitted Update Report on June 18, 2004 in order to report interim actions to be taken.

## **V. Issues for Brookhaven Site Office/Brookhaven National Laboratory Management Awareness**

This section is intended to identify areas of possible concern resulting from an analysis of ORPS and non-ORPS data for the quarter and the one-year period (at a minimum) ending with the completion of the second quarter in CY 2004.

## **A. New Area for Management Attention**

### **1. Electrical Utility Strikes**

As noted in section III above, six electrical utility strikes have occurred since CY 2000 and four out of the six since CY 2002. Management attention is necessary to ensure corrective and preventive actions specified in occurrence report CH-BH-BNL-PE-2004-0002 “Electrical Utility (Encased in Concrete Floor) Conduit Strike”, which was declared on April 19, 2004, are completed in accordance with their target due dates and that they effectively address issues identified in the report. This concern will be monitored closely in future ORPS Quarterly Performance Analysis and Summaries.

## **B. Area for Continued Management Attention:**

### **1.”Recurring Material Handling Problems” Recurring ORPS Report**

Occurrence report CH-BH-BNL-BNL-2004-0005 “Recurring Material Handling Problems”, was declared on 3/24/04. Subsequent to the issuance of this occurrence report, nonreportable material handling events occurred, as follows:

- Damaged detector at STAR after 10 foot drop on May 17, 2004.
- 500 # steel block falls (3 to 4 feet) from forklift on June 11, 2004.

In response to these continuing material handling events the ORPS Coordinator facilitated a meeting concerning the status of the “Recurring Material Handling Problems” ORPS Report and submitted an Update Report on June 18, 2004, which detailed further interim actions to be taken to mitigate material handling problems. Specifically the Laboratory Deputy Director of Operations issued a memorandum on July 2, 2004, which directed Level 1 Managers to take the following interim actions:

- Ensure all required material handling training/qualifications are current for supervisors and workers.
- Require that all supervisors involved in mechanical material handling operations discuss the details of planned work with the person(s) performing the work with the intent of increasing their awareness for safety-related aspects of each job.
- Require supervisors, where necessary, provide guidance and give direction at all critical phases of the work (consider establishing hold points at which they must be contacted before work proceeds, as necessary, e.g., load securement); and to record/document those instructions they give either in a dated logbook or noted on work orders. The Safety and Health Services Division will randomly audit these logs to assure compliance.
- Require all personnel performing mechanical material handling, especially those using motor-driven mechanical material handling equipment, adhere to the Lifting Safety Subject Area and all other relevant procedures and immediately report any deviations from procedures.

Continued management attention is highly recommended to prevent recurrence of recurring material handling problems.

## **VI. References**

“A Multidisciplinary Task Force Review of Selected Second and Third 2003 Calendar Quarter Occurrences and Analysis of Management Systems at Brookhaven National Laboratory,” December 2003.

DOE Guide 231.1-2, *Occurrence Reporting Causal Analysis Guide*, August 2003.

DOE Manual 231.1-2, *Event Reporting and Processing of Operations Information*, August 2003.

DOE Order 231.1A, *Environment, Safety and Health Reporting*, August 2003.

ORPS Project Implementation Plan

Report of the Committee Investigation of the Category “R” Recurring Occurrence (CH-BH-BNL-BNL-2004-0005), April 29, 2004.